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THE GINKGO OR MAIDENHAIR TREE, *GINKGO BILOBA* (L), ITS SPECIAL SIGNIFICANCE TO THE MORTON ARBORETUM

"The Arboretum is a Ginkgo, and a Ginkgo it will remain". This significant statement by Mr. Joy Morton, founder of the Morton Arboretum, not only expresses in brief the philosophy responsible to a great extent for the tremendous growth and present status of the Arboretum, but also links it in an unusual way to a unique Oriental tree known as the last representative of a primitive race of trees which in the earlier stages of the world's history filled an important place in its vegetation.

Translating Mr. Morton's symbolic words, it may be explained that the Ginkgo is botanically in a class by itself*, a monotypic genus (deciduous) allied to the coniferae, but distinct from them. So too is the Morton Arboretum the only one of its kind, a privately owned, endowed and operated horticultural foundation without affiliation or political connection, but dedicated to public service in the fields of arboriculture, horticulture and related subjects.

That the Ginkgo has an almost universal appeal is acknowledged, but not everyone may be aware of the trees' special interest to different people. To the geologist it represents a veritable living fossil whose records in rock prove its existence on the earth for ten million years (from the Jurassic period on). To the paleobotanist, fossil plant specialist interested in tracing evolutionary development from the simple forms of the past, the Ginkgo is an especially fascinating subject. The concern of the plant geographer is with the Ginkgo's once wide distribution throughout the temperate regions of both the northern and southern

* Taxonomically the family *Ginkgoaceae* is grouped with the Gymnosperms (plants with naked ovules). Most deciduous trees are Angiosperms (ovules enclosed in an ovary).

hemispheres and with its strange and sudden disappearance as a native. Obviously the botanist is most attracted to the trees' structural peculiarities which are quite unlike anything else in the vegetable kingdom. The fan-like leaves, for example, greatly resemble the pinnae of the Maidenhair Fern, suggesting an obscure connecting link between the ferns and their allies. The naked plum-like seeds bearing a resemblance to both the California Nutmeg (*Torreya*) and the Cycads indicate the possibility of still another connection, in this case with the latter group, a family of very ancient tropical gymnosperms intermediate between tree ferns and palms. Two other ginkgo characteristics, the occurrence of shoots of two types (more fully described later) and the regular shedding of the foliage in autumn, are features more typical of the larches.

The landscape architect sees in the Ginkgo a dependable ornamental of sizeable proportions, often stately and picturesque and furnished with bright green foliage of striking character. He is interested also in the tree's hardiness and vigor, indifference to drouth and other unfavorable growing conditions, and in the ease with which it may be transplanted and maintained. For, it is a subject whose freedom from insects and diseases places it in a class apart in these days of tree troubles. The home owner, in addition to recognizing the importance of the foregoing qualifications, thinks of the Ginkgo as a good looking, out of the ordinary shade tree. He may or may not be aware, however, that it is generally regarded as slow growing, though long lived, and is an excellent street tree.

Historians tell us that the first known record of the Ginkgo in literature was in a Chinese book on Agriculture dating from the 8th century of our era. A later reference in a Chinese Herbal of 1578 refers to the "ya-chio-tzee", "tree with leaves like a ducks foot". The aptness of this description is evident. As to the name itself, Ginkgo is actually the Japanese translation of the Chinese "Yin-kou".

First knowledge of the Ginkgo in the western world was through a Dutch surgeon by the name of Engelbert Kaempfer who visited Japan in 1682 in the service of the Dutch East India Company. In a book published upon his return he gave a good account of the tree. It was through the Dutch also that the first Ginkgo found its way to Europe, sometime between 1727 and 1737. It was planted in the Botanic Garden at Utrecht. Around the middle of the eighteenth century it reached England, presumably in the form of seeds brought directly from Japan. The first one grown from this source flowered in Kew Gardens in 1795, a male tree.

William Hamilton is credited with introducing the Maidenhair Tree to America, having imported a specimen from England in 1784 for his garden at Woodlands near Philadelphia. This estate has since become Woodlands Cemetery, in which this Ginkgo is presumably still growing. There is another old tree in the John Bartram Garden in West Philadel-



Ginkgo biloba (L.), Maidenhair Tree, near the Japanese
Island inlet along Forest Road. (Planted in 1926).

phia, one exceeding 9 ft. in girth. Some consider it older than the one at Woodlands.

Whereas magnificent specimens 100 ft. or more in height and from 18 to 25 ft. in girth, claimed with authority to be more than a thousand years old, still exist in China, Japan and Korea, usually in association with temples, religious shrines and palaces, trees of this magnitude are uncommon outside of the Orient.

Considerable variation is evident in the Ginkgo's growth habits, some trees being single trunked and sparsely branched while others are low headed with several erect main stems. In either instance the branches extend outward from the trunk at acute angles almost paralleling each other. Young trees often have an irregular gawky or ungainly appearance, although those whose primary branches are arranged radially in what appear to be whorls show a more even spire-like outline. Age becomes the Ginkgo's appearance, the crown broadening from loosely pyramidal to conical and rounded. Older branches are both ascending and spreading with the stiff angularity of youth relieved by the pendulous tipped, often horizontal secondary branches. The twigs are yellowish brown and smooth and the ashen gray bark rather corky and fissured into irregular ridges.

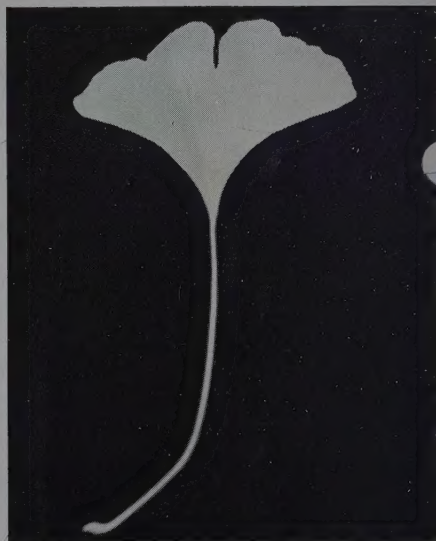
The trees' most distinctive feature, the leathery foliage, is as has been mentioned before, unlike that of any other tree. Long, grooved petioles display the fan shaped, parallel veined blades 2 to 3 inches across. They are usually incised or cleft at their broad summit tapering to a wedge shaped base. Their light green summer coloring is very pleasing to look at but the clear yellow autumn change is especially lovely. After a hard frost the leaves fall almost simultaneously. The arrangement of the foliage is also distinctive, being supported in two ways; on short, stout spurs which increase very slowly in length and bear clusters of 3 to 5 leaves at their tips, and on long free growing shoots upon which the leaves are arranged alternately. Under ideal conditions plants usually show a predominance of the latter type growth.

Ginkgo flowers are very inconspicuous and completely lacking in ornamental interest. They are dioecious (sexes separate), the males (staminate) occurring in cylindrical short stalked catkins about an inch long, the female (pistillate), in pairs at the apex of slender stalks. Each flower is made up of a minute globose body subtended at the base by a cup shaped enlargement. Pollination is done by the wind, after which delayed fertilization by motile sperm cells takes place. This is another of the Ginkgo's peculiarities. Ovoid plum-like fruits an inch or more in diameter follow, good sized light colored kernels coated with a fleshy layer of orange-yellow pulp. This covering is very ill scented due to the presence of a fatty acid (ginkgoic), whose toxic qualities are known to cause dermatitis quite as severe as that resulting from contact with poison

ivy. The sweet kernels, called Silverfruit by the Chinese, are a highly regarded delicacy, eaten after roasting.

While several horticultural varieties of the Maidenhair tree are in cultivation the Sentry Ginkgo, *Ginkgo biloba fastigiata*, is the one most frequently encountered. Its narrow columnar or fastigiate habit is similar to that of the Lombardy Poplar, to which it is a far superior tree. The variety "*pendula*", with pendulous branches, is a more graceful though not as well known subject. Four additional variations are essentially of horticultural interest: "*aurea*", with yellow foliage; "*macrophylla*", a larger leaved sort; "*variegata*", whose leaves show yellowish variegations and "*laciniata*", with larger, more deeply incised leaves.

E. L. Kammerer



Ginkgo biloba fruit cluster (left) and leaf (right)

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